

REMARKS

There are 18 claims pending, of which claims 1, 8 and 14 are in independent form. By this amendment, claims 1-7 have been canceled without prejudice or disclaimer, and claims 8, 11 and 12 have been amended. Specifically, claim 8 has been amended to more clearly identify a particular feature of the claimed invention regarding the heat sink, which has a plurality of cooling fins defining an annular cavity. Support for the claim amendment can be found, e.g., in Figs. 2(a) and 2(b). Care has been exercised to avoid introduction of any new matter.

Claims 3 and 12 are objected to due to certain informalities.

By this amendment, claims 1-7 have been canceled. Therefore, the objection to Claim 3 is now moot.

As to claim 12, it has been amended to in a manner as suggested in item 1, page 4 of the outstanding Action.

35 U.S.C 102 Rejection

Claims 1, 6, 7, 8, 11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyahara et al. (U.S. Patent No. 5,940,268, hereinafter "*Miyahara*").

For at least the reasons stated hereinbelow, the rejection is respectfully traversed.

By this amendment, claims 1-7 have been canceled. Therefore, the rejection to claims 1, 6 and 7 is now moot.

The present invention, as set forth in amended claim 8, specifically recites a plurality of cooling fins defining an annular cavity and a centrifugal fan formed in an

annular cavity so as to be embedded into the heat sink. This feature, as discussed in the specification, is advantageous in that “the heat sink 100 is used to previously direct the heat concentrated in the central region of the heat-generating device to a larger heat dissipating surface...” (see Fig. 2a and page 7, lines 6-14 of the specification).

Element 82 as disclosed in *Miyahara* is cited by outstanding Action as corresponding to the heat sink of the present invention. However, Element 82 of *Miyahara* does not have any annular cavity structure as specifically required by the claimed invention. Instead, Element 85 of *Miyahara* is formed in a cavity.

MPEP 2131 states that a “...claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” (Verdegaal Bros. V. Union Oil Co. of California, 814 F.2d 628,631 (Fed. Cir. 1987)). Therefore, since *Miyahara* does not disclose, teach, or suggest the claimed element of a heat sink having a plurality of cooling fins wherein the cooling fins define an annular cavity, claim 8 is allowable over the prior art of record.

As to claims 11 and 13, which depend from claim 8, they are also allowable for at least the reasons stated above with respect to claim 8.

35 U.S.C. 103 Rejections

Claims 2, 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Miyahara* in view of Liang et al. (U.S. Patent Application Publication No. 2002/0018336, herein after “*Liang*”).

For at least the reasons stated hereinbelow, the rejection is respectfully traversed.

By this amendment, claims 1-7 have been canceled. Therefore, the rejection to claims 2 and 3 is now moot.

Claim 12, which depends from claim 8, is allowable for at least the reasons stated above with respect to claim 8.

Claims 4, 5, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Miyahara* in view of *Heitzig* (U.S. Patent No. 4,612,979).

For at least the reasons stated hereinbelow, the rejection is respectfully traversed.

By this amendment, claims 1-7 have been canceled. Therefore, the rejection to claims 4 and 5 is now moot.

Claims 9 and 10 require and are characterized by, *inter alia*, a heat sink having a plurality of cooling fins wherein the cooling fins define an annular cavity and a cover is formed on both the heat sink and centrifugal fan wherein the cover is airtight.

Heitzig teaches an apparatus for the cooling of electronic assemblies or components arranged in slide-in circuits located one above the other in a rack, wherein each slide-in unit "...consists of two airtight side walls, an airtight bottom wall, an airtight back wall, and an airtight cover plate extending obliquely upward and forward." (See abstract; Col. 4, lines 20-23).

However, *Heitzig* fails to teach or even remotely suggest, *inter alia*, a heat sink having a plurality of cooling fins wherein the cooling fins define an annular cavity and an air tight cover is formed on both a heat sink and centrifugal fan.

“To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art” (*In re Royka*, 490F.2d 981 180 USPQ 580 (CCPA 1974)).

Since neither *Miyahara* nor *Heitzig* teaches or suggests a heat sink having a plurality of cooling fins wherein the cooling fins define an annular cavity and a cover is formed on both a heat sink and centrifugal fan wherein the cover is airtight, claims 9 and 10 are allowable over the prior art of record.

Claims 14, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Liang* in view of *Heitzig*.

For at least the reasons stated hereinbelow, the rejection is respectfully traversed.

The present invention, as set forth in claim 14, requires and is characterized by, *inter alia*, a heat sink having a plurality of cooling fins wherein the cooling fins form a cavity where a centrifugal fan is embedded within and a cover formed on both the heat sink and the centrifugal fan. The cavity, as shown in Fig. 2b, Item 120, has a plurality of cooling fins (Fig. 2a, Item 110) on both the inside and the outside of the cavity (See Fig. 2(b)). This feature is advantageous since “...the heat sink 100 is used to previously direct the heat concentrated in the central region of the heat-generating device to a larger heat dissipating surface...” (See page 7, lines 6-14 and Fig. 2(a)).

Liang fails to teach or suggest, *inter alia*, a heat sink having a plurality of cooling fins, which define a cavity, a centrifugal fan formed in the cavity and a cover formed on the heat sink and the centrifugal fan.

Heitzig fails to overcome the deficiencies of *Liang*. *Heitzig* teaches an apparatus for cooling electronic assemblies or components arranged in slide-in circuits located one above the other in a rack. The outstanding Action incorrectly equates the cover of the present invention with *Heitzig's* teachings of sidewalls or side plates for slide-in units or compartments. Additionally, *Heitzig* fails to teach or suggest "a cover formed on said heat sink and said centrifugal fan" as set forth in claim 14.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art" (*In re Royka*, 490F.2d 981 180 USPQ 580 (CCPA 1974)).

In the instant application, not only does *Heitzig* fail to teach or suggest the present invention as set forth in claim 14, even if one skilled in the art were motivated to combine *Heitzig* and *Liang*, such combination still fails to teach, or even remotely suggest, a centrifugal fan formed in the cavity and a cover formed on the heat sink and the centrifugal fan.

Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Liang* in view of *Miyahara*.

For at least the reasons stated hereinbelow, the rejection is respectfully traversed.

Claims 16 and 18, which depend from claim 14, are allowable for at least the reasons stated above with respect to claim 14.

In view of the aforementioned accompanying remarks and amendments, claims 8-18 are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. The fees for such an extension, or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 50-1299.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Raymond J. Ho', with a stylized flourish at the end.

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APPENDIX

(VERSION WITH MARKINGS TO SHOW CHANGES MADE)

IN THE CLAIMS:

8. (Amended) An embedded centrifugal cooling device, comprising:
a heat sink, including a plurality of cooling fins, said cooling fins defining an annular cavity; and
a centrifugal fan, formed in said annular cavity so as to be embedded into said heat sink.
11. (Amended) The embedded centrifugal cooling device according to claim 8, wherein said annular cavity matches said centrifugal fan.
12. (Twice Amended) The embedded centrifugal cooling device according to claim 8, wherein said cooling [fans] fins are distributed under and around a region extending from a central region of said centrifugal fan to a periphery of said centrifugal fan.